

## CHAPTER 6 PNEUMATIC CONTROLLERS

This chapter addresses the EPA's responses to public comments on pneumatic controllers in the EPA's Proposed *Oil and Natural Gas Sector: Emission Standards for New , Reconstructed, and Modified Sources*.

Commenters also raised issues on topics that are not covered by this chapter. Please refer to the following chapters for responses specific to those issues:

- **Chapter 1:** Source Category
- **Chapter 2:** Regulation of Methane
- **Chapter 3:** Well Completions
- **Chapter 4:** Fugitives Monitoring
- **Chapter 5:** Pumps
- **Chapter 7:** Compressors
- **Chapter 8:** Equipment Leaks at Natural Gas Processing Plants
- **Chapter 9:** Liquids Unloading
- **Chapter 10:** Storage Vessels
- **Chapter 11:** Compliance
- **Chapter 12:** Regulatory Impact Analysis
- **Chapter 13:** Existing State, Local, and Federal Rules
- **Chapter 14:** Subpart OOOO
- **Chapter 15:** Miscellaneous
- **Chapter 16:** Comment Period Extension

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### 6.1 Support for the Proposed Standards

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**Commenter Name:** Michael J. Meyers, et al., Assistant Attorneys General

**Commenter Affiliation:** Attorneys Generals of New York, Massachusetts, Oregon, Rhode Island, and Vermont (States)

**Document Control Number:** EPA-HQ-OAR-2010-0505-6940

**Comment Excerpt Number:** 7

**Comment:** The Proposed Standards for Compressors and Pneumatic Devices are Technically Achievable and Cost Effective. The Proposed Rule demonstrates that methane can be significantly and cost-effectively reduced by establishing emission standards for methane from compressors and pneumatic devices. Centrifugal compressor emissions may be cost-effectively controlled by installation of a capture and combustion device on wet seal compressors, while reciprocating compressor emissions may be controlled by the periodic replacement of rod packing systems. 80 Fed. Reg. at 56,619-21. Pneumatic controller emissions can be significantly reduced by replacing high-bleed controllers with either low-bleed or zero-bleed controllers. Methane emissions from pneumatic pumps can be cut in many instances by replacing the pumps at natural gas processing plants with instrument air pumps, and by routing emissions from pumps in the production, transmission, and storage segments to an existing control device or a process. Id. at 56,623-27. These findings are consistent with previous EPA determinations concerning this equipment and in other studies. See, e.g., Compressors White Paper at 43; Pneumatic Devices White Paper at 56-57; U.S. Env'tl. Prot. Agency, Reducing Methane Emissions from Compressor Rod Packing Systems 1 (2006) (indicating payback periods from one to three months for compressor maintenance activities that reduce methane emissions); WRI Clearing the Air Report at 6 (replacing existing high-bleed pneumatic devices with low-bleed equivalents throughout natural gas system identified as one of three strategies that could cost-effectively cut methane emissions by thirty percent); Natural Res. Def. Council, Leaking Profits: The Oil and Gas Industry Can Reduce Pollution, Conserve Resources, and Make Money by Preventing Methane Waste 1 (2012) [hereinafter NRDC Leaking Profits Report] (identifying improved maintenance of reciprocating compressors and replacement of high-bleed pneumatic controllers with low-bleed or zero-bleed controllers as two of ten cost-effective strategies that could reduce methane emissions from the oil and gas sector by eighty percent).

**Response:** Comment is a supportive comment to which no response is required. We have finalized the standards as proposed, including the definition of affected facility based on a bleed rate of 6 scfh.

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**Commenter Name:** Darin Schroeder, David McCabe, Lesley Fleishman and Conrad Schneider  
**Commenter Affiliation:** Clean Air Task Force et al.  
**Document Control Number:** EPA-HQ-OAR-2010-0505-7062  
**Comment Excerpt Number:** 82

**Comment:** The record also shows that it is very feasible to use low-bleed controllers instead of high-bleed controllers. For example, Colorado standards first required operators to replace existing high-bleed controllers with low-bleed controllers in the urban portions of the Denver-Julesberg basin in 2009. The 2009 Colorado standard contained provisions allowing operators to keep high-bleed controllers in service if they showed that doing so was necessary for “safety and/or process purposes.” *Not a single operator requested such an exemption*, and there is no evidence indicating that these requirements have caused any operational problems. These replacements have reduced annual methane emissions in the Denver-Julesberg basin by thousands of tons per year. Certainly, EPA’s proposal to require use of low-bleed controllers within the transmission and storage segment of the industry is very feasible and cost-effective.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-6940, Excerpt 7.

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**Commenter Name:** Haley Colson Lewis, Programs Manager and Michael Hansen, Interim Executive Director  
**Commenter Affiliation:** GASP  
**Document Control Number:** EPA-HQ-OAR-2010-0505-6436  
**Comment Excerpt Number:** 5

**Comment:** GASP also strongly encourages EPA to not weaken beyond the limit of 6 standard cubic feet per hour the natural gas bleed rate limit for pneumatic controllers.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-6940, Excerpt 7.

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**Commenter Name:** Gary Buchler  
**Commenter Affiliation:** Kinder Morgan, Inc.  
**Document Control Number:** EPA-HQ-OAR-2010-0505-6857  
**Comment Excerpt Number:** 26

**Comment:** EPA proposes a natural gas bleed rate limit of 6 standard cubic feet per hour (“scfh”) for pneumatic controllers to reduce methane and VOC emissions from individual, continuous

bleed, natural gas-driven pneumatic controllers at locations across the industry other than natural gas processing plants. Consistent with the current requirements under the 2012 NSPS for control of VOC emissions from pneumatic controllers in the production segment and at natural gas processing plants, the proposed standards provide exemptions for certain critical applications based on functional and safety considerations. Kinder Morgan supports these exemptions to address concerns regarding safety, emergencies, and otherwise non-routine situations that require the use of a controller with a continuous natural gas bleed rate of greater than 6 scfh.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-6940, Excerpt 7.

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## 6.2 Opposition to the Proposed Standards

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**Commenter Name:** Rodney Sartor

**Commenter Affiliation:** Enterprise Products Partners L.P.

**Document Control Number:** EPA-HQ-OAR-2010-0505-6807

**Comment Excerpt Number:** 9

**Comment:** The proposed NSPS Subpart OOOOa imposes the same requirements for pneumatic controllers as currently regulated under Subpart OOOO in the gathering and boosting stations, and natural gas processing plants, on pneumatic controllers within the transmission and storage segment. We believe that these additional controls for the storage and transmission sector are unjustified and unnecessary because these controllers do not meaningfully contribute to the emission of VOCs or methane, and the compliance costs associated with these regulations cannot be justified by the minute reductions in emissions that would result.

**Response:** The EPA disagrees with the commenter's assertion that regulation of pneumatic controllers in the transmission and storage segment is not justified. As shown in the TSD to the final rule, we estimate that baseline nationwide emissions from the approximately 262 new continuous bleed pneumatic controllers installed in this segment each year total 790.4 tpy of methane and 21.9 tpy of VOC. Controlling emissions in this segment by installing low-bleed pneumatic controllers, as finalized, is very cost effective at \$9/ton of methane reduced and \$323/ton of VOC reduced or, on a pro-rated basis, \$4 and \$162 per ton, respectively.

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### 6.3 Best System of Emission Reduction

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**Commenter Name:** Robert Winkler

**Commenter Affiliation:** International Institute for Risk Management, Washington University

**Document Control Number:** EPA-HQ-OAR-2010-0505-5348

**Comment Excerpt Number:** 5

**Comment:** We request a set of changes that clarify and ensure compliance with the underlying obligation of all lessees to minimize waste of natural gas. Operators must operate in a manner that protects the environment and conserves mineral resources as follows:

Conducting all operations in a manner which ensures the proper handling, measurement, disposition, and site security of leasehold production; which protects other natural resources and environmental quality; and which protects life and property. The operating rights owner or operator shall conduct all operations in a manner and which, as a first priority, protects the environment and public health including by minimizing waste and which also results in maximum ultimate economic recovery of oil and gas and, as a second priority, results in with minimum waste and with minimum adverse effect on ultimate recovery of other mineral resources.

COGCC BLM should add a definition of “best available technology for oil and gas operations” as follows:

Best Available Technology means the following:

(1) Best Available Technology shall result in an emission rate that does not exceed the natural gas emissions performance standard.

(2) Best Available Technology at a minimum includes the use of the following controls:

Pneumatic Devices—For all pneumatic devices, Operators must employ no-bleed controllers. If Operators are able to demonstrate to the satisfaction of BLM that the use of a no-bleed controller is impossible, the Operators may use a low-bleed controller. High bleed pneumatic devices are prohibited in all circumstances.

(3) Best Available Technology shall also include any measures, technologies, or processes that become available after the effective date of these regulations that allow for recovery of additional natural gas, unless the Operators have demonstrated to the satisfaction of COGCC that such technologies are not technically feasible or pose a significant, elevated health or safety risk.

**Response:** In this final rule, the EPA is finalizing its proposal with respect to pneumatic controllers. In determining BSER, the EPA must determine that the control efficiency can be achieved by the affected facilities to which it applies, and we believe that no-bleed controllers have technical infeasibility concerns that would not allow them to be installed throughout industry. See section 6.5 of the TSD for the proposed standards for additional information.

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**Commenter Name:** Public Hearing Comments On Proposed Climate, Air Quality, and Permitting Rules for the Oil and Natural Gas Industry; Tuesday, September 29, 2015; 9:05 AM - 8:00 PM; Public Hearing #1 - Pittsburgh, Pennsylvania

**Commenter Affiliation:** None

**Document Control Number:** EPA-HQ-OAR-2010-0505-7338

**Comment Excerpt Number:** 184

**Comment:** Additionally, the rules should be modified to require the use of no leak pneumatic devices at all sites where electricity is available. CSSD performance standards already include that as a requirement.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** Darin Schroeder, David McCabe, Lesley Fleishman and Conrad Schneider

**Commenter Affiliation:** Clean Air Task Force et al.

**Document Control Number:** EPA-HQ-OAR-2010-0505-7062

**Comment Excerpt Number:** 85

**Comment:** EPA Should Consider More Protective Approaches to Reducing Pneumatic Controller Emissions.

EPA's proposed standards fail to account for the availability of either zero-emitting technologies or approaches to reduce emissions by routing emissions from controllers to a process or control device. EPA considered only two control options for pneumatic controllers: "(1) use of a low-bleed controllers; or (2) use of non-gas driven controllers (i.e., instrument air systems)." The proposed standards do not consider the route to process approach in any way, and they only require zero-bleed technology for continuous-bleed pneumatic controllers at natural gas processing plants.

EPA's conclusion that only low-bleed controllers are appropriate outside of natural gas processing plants disregards numerous zero-bleed technologies which can be feasible at sites other than processing plants, as well as the usefulness and wide applicability of routing emissions from pneumatic controllers to processes on site.

#### Inherently zero-emitting technologies

Instrument air systems and other inherently non-emitting sources, such as electric actuators, could be feasible at many facilities beyond gas processing plants. While sufficient electrical service may not be available at each and every site, many sites do have sufficient access, or may be able to use other approaches to generate power, either for instrument air or for electric actuators. Other sites may be able to use closed-loop gas-driven controllers, a different zero-emissions technology.

- *Grid connection.* At sites that are connected to the electric grid, or with power available nearby, instrument air systems can replace gas-driven pneumatic controllers. As discussed below, for even modest facilities, instrument air will be cost-effective when power is available.
- *On-site generator.* Many sites produce power for on-site use using a natural gas-powered generator. Building out an instrument-air pneumatic system would be feasible in such cases. Beyond a traditional gas-powered generator, innovative technologies can bring electricity to remote sites. For example, thermoelectric generators are available that can be used to convert waste heat in compressor exhaust to electricity at remote oil and gas sites.
- *Solar generator with battery storage.* Natural gas-driven devices can be replaced with electric actuators with low electricity requirements. Such devices are engineered by a variety of companies, and the technology continues to advance. One company has installed over 3,000 electric actuators at oil and gas sites in a variety of applications (dump valves, gas lift valves, separators, pressure valves, and compressor scrubbers). In many geographic locations, the solar resource is sufficient to power these actuators.
- *Closed-loop pneumatic actuators.* Some pneumatic controllers use pressurized natural gas to operate but are designed to vent exhaust gas back into the line, as a “closed-loop” option. Assuming that the device does not leak, this is a zero-bleed technology, though it may be limited in applicability.

Electricity availability at sites is increasing while the power required for zero-bleed pneumatic alternatives is decreasing. As a result, many sites, both in the production and transmission and storage segments, will be able to install zero-bleed pneumatic alternatives at low net cost. Thus, EPA should revise its rule to account for the availability of such technologies. Given the size of many production and transmission facilities, even older technologies, such as compressed air systems, can be cost-effective means of avoiding methane emissions. For example, based on cost figures from EPA’s Natural Gas STAR reports and the agency’s emissions factors, we estimate that a three well site might typically have eight pneumatic controllers, emitting about 6.2 tons per year of natural gas (using the overall average emission factors from Allen et al. (2015)). If power is available at the site, either from the grid or one of the on-site generation methods described above, an instrument air system to drive the pneumatic controllers could eliminate the methane pollution at a net abatement cost of \$1,100 per short ton of methane (assuming the single-pollutant method that EPA uses to examine costs in its proposal). Since this approach would also abate VOC pollution from pneumatic controllers, we also calculated the abatement cost for VOC. Using the single pollutant method, the VOC abatement cost is \$3,955 per short ton of VOC. The multi-pollutant method results in even lower net costs: \$550 per short ton of methane abatement and \$1,978 per short ton of VOC abatement.

Route to process.

Emissions from pneumatic controllers can, alternatively, be controlled by routing the emissions to a process, such as an on-site VRU or fuel lines for an on-site engine, boiler, or heater. A second option, inferior to routing to a process but certainly preferable to uncontrolled venting, is routing the emissions to a control device. While capturing gas that would otherwise be vented



and routing it to a process is always preferable to flaring and must be prioritized under any proposed standard, routing to a completion combustion device should be permitted where venting would be an operator's only other option.

The general approach of routing to a process or control is similar to the one EPA has taken in its proposed standards for pneumatic pumps that are not at gas processing plants (proposed § 60.5393a(b)), although as noted below, EPA should strengthen those proposed standards. Wyoming's recent rules for existing pneumatic controllers in the Upper Green River Basin allow operators of existing high-bleed controllers to route emissions "into a sales line, collection line, fuel supply line, or other closed loop system." Some operators have chosen to route emissions from pneumatic controllers to fuel lines in Wyoming. Additionally, the California Air Resources Board (CARB) released Draft Regulatory Language in April 2015, which prohibits venting from *any* continuous-bleed pneumatic controller. To control emissions from these devices, CARB included as a compliance option: "Collect the vented natural gas with a vapor collection system and route the collected gas to an existing sales gas system, fuel gas system, or vapor control device." This approach would work for all types of pneumatic controllers.

Furthermore, as with pneumatic pumps, this approach would be cost-effective. EPA estimates that the capital and installation cost of routing emissions from a pneumatic pump to an existing VRU is \$2,000; the annualized cost is \$285. These cost estimates are equally applicable to the costs of routing emissions from a pneumatic controller to process or control. A single intermittent bleed controller, emitting at the average rate for pneumatic controllers as estimated by the Reporting Program (13.5 scfh), vents 118 Mcf of natural gas per year, which, at \$4 per Mcf, has a resale value of \$473. Therefore, routing emissions from intermittent-bleed controllers to a VRU would have a negative cost. If intermittent-bleed controllers are emitting at the rates reported in Allen *et al.* (2013), 17.4 scfh, then the cost savings from this approach would be even more striking. Finally, we consider the emissions estimates from Allen *et al.* (2015), which reported that oil and gas pneumatic controllers emit an average of 5.5 scfh, but also found that sites have an average of 2.7 pneumatic controllers per well. Even for a single well site with just two controllers—below the average of 2.7—if each device emitted 5.5 scfh, they would total 96 Mcf per year, with resale a value of \$384. The cost of routing two controllers to a VRU would only be slightly higher than the cost of routing a single controller to the unit on a small site such as a single well pad, so even with the lower emissions factors reported by Allen *et al.* (2015), the increased revenue from capturing gas from pneumatic controllers would exceed the cost of control.

**Response:** The EPA disagrees with the commenters in that our BSER analysis did consider a full range of potential control options for pneumatic controllers, including zero-emitting technologies (see the 2015 proposal TSD). The TSD for the proposed rule includes a full cost analysis only for the use of low-bleed pneumatic controllers because other options were eliminated from consideration based on feasibility considerations prior to that costing stage in the analysis. The TSD for the proposed rule includes the following information related to other control options for pneumatic controllers:

- "[C]losed loop systems are applicable only in instances with very low pressure and may not be suitable to replace many applications of bleeding pneumatic devices". (Page 130)

- “[I]ntermittent controllers are ... assumed to not always be used in the same functional application as continuous bleed controllers. Therefore, intermittent controllers are not an appropriate option for control for all continuous bleed controllers”. (Page 136)
- “The use of instrument air systems ... requires a constant source of electric power. Because electric power is not necessarily available at all transmission and storage affected facilities, the use of instrument air systems would not be practically feasible as a control for emissions from pneumatic controllers in this industry segment.” (Pages 135-136)
- “Likewise, because the mechanical systems identified for use in this industry would require, at minimum, a backup source of electric power, this option is also not considered to be practically feasible for use in controlling these pneumatic controller emissions.” (Page 136)
- “The enhanced maintenance option would be considered to be too variable and costly as a viable option for control pneumatic controller emissions”. (Page 136)

Table 6-5 in the proposal TSD describes the potential control options and gives their applicability, effectiveness and estimated cost range.

In addition, the BSER analysis conducted for the proposed and finalized subpart OOOO (see the 2011 NSPS TSD) considered solar-powered controllers, fuel-cell powered controllers, mechanically-controlled devices and no-bleed devices wherever electricity is available and found that any such controller system would require a backup system (consisting of at least an electrical generator) to operate the controllers when the primary system was inoperable. When considering the cost of the backup system, the EPA found that these options were not cost-effective. This analysis is likewise applicable to pneumatic controllers in the transmission and storage segment.

Regarding intermittent controllers, in this rulemaking, the EPA did not propose GHG standards for intermittent controllers. The EPA plans to seek additional information on these sources via an information collection request. For more information on the upcoming information collection request, see section III.E of the preamble to the final rule.

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**Commenter Name:** Darin Schroeder, David McCabe, Lesley Fleishman and Conrad Schneider  
**Commenter Affiliation:** Clean Air Task Force et al.  
**Document Control Number:** EPA-HQ-OAR-2010-0505-7062  
**Comment Excerpt Number:** 87

**Comment:** We urge EPA to strengthen the standards for pneumatic controllers in several respects. First, EPA should require zero-bleed controllers at facilities where electricity is available (from the grid or generated on site). Electricity is generally available at large compressor stations, large production facilities, and sites of all sizes in urbanized areas. Alternatively, operators should route emissions to a process instead of installing zero-bleed technologies. The standards should require operators of sites without access to electricity to route emissions from pneumatic controllers to a process such as to a VRU or fuel line, if available on

site. If routing to a process is not available at a site, operators should route emissions to a control device, though this approach is less protective than standards based on zero-bleed devices, and routing to a process should always be the preferred method of control.

For specific cases where pneumatic controllers are required at sites where neither zero-bleed technology nor route to process approaches are feasible, EPA must set standards for all pneumatic controllers (continuous-bleed and intermittent-bleed) that minimize *actual* emissions. It can do so via two improvements. First, EPA should require controllers of both types to emit below six scfh. EPA's proposed standard already would require a lower design bleed rate for continuous-bleed controllers. Properly designed and well-functioning intermittent-bleed controllers can emit below 6 scfh in many applications. Indeed, Wyoming requires that *all* pneumatic controllers emit below 6 scfh, regardless of whether they are continuous-bleed or intermittent-bleed, at new and modified facilities.

In addition, since pneumatic controllers often improperly function and emit more than designed as discussed above in Section XX, EPA must ensure that any controllers venting natural gas continue to operate as designed over their service lifetime. As a first measure, all intermittent bleed gas-driven controllers must be inspected as part of frequent and comprehensive leak detection and repair (LDAR) surveys to ensure that they are not continuously emitting, as we have discussed above in Section III.A.XX. EPA must ensure that newly installed pneumatic controllers that vent at facilities not subject to those provisions (i.e., existing sites) are also inspected to ensure that they do not function improperly and emit excessively.

Furthermore, while gas-driven pneumatic controllers necessarily emit some gas even when functioning properly, controllers of all types frequently emit in excess of the amount they are designed to emit. EPA must ensure that emissions from controllers are regularly measured to ensure that they are not venting excessively. Such volumetric flow measurements can be done at low cost. CARB's draft regulatory language would require that operators of certain reciprocating compressors measure volumetric flow from cylinder rod packing. Measuring the volumetric or mass flow rate from a pneumatic controller with methods such as a high volume sampler, bagging, or calibrated flow measuring instruments gives a real value for emissions, while hydrocarbon concentration (which would be measured while carrying out Method 21) is only weakly correlated with emissions. Some leak-detection service providers routinely measure emissions from leaks with high volume samplers, indicating that the cost of these measurements is quite reasonable. EPA should require operators to regularly measure the volumetric flow of emissions from controllers that vent natural gas to the atmosphere as part of their demonstration of continuous compliance with EPA's standards of performance for those devices. Since the proposed regulation would apply only to new and modified controllers, operators could readily facilitate such measurements by, for example by routinely installing pneumatic controllers with hardware attached to simplify attachment of flow meters.

We recognize that certain intermittent-bleed pneumatic controllers should actuate only very rarely. For example, Allen *et al.* (2015) observed that controllers for emergency shut-off devices made up 12 percent of the population of the controllers in that study. It may be reasonable to exclude some intermittent-bleed devices from control requirements for vented gas, if operators can demonstrate that actuation is very uncommon. (If facilities have instrument air installed,

however, the costs of connecting that air supply to every intermittent-bleed controller are very low, so that should be required.) Yet even very rarely actuating controllers should still be subject to monitoring during leak detection inspections to ensure that the devices are not emitting even when they are not actuating.

While specific treatment of intermittent-bleed actuators that very rarely actuate may be warranted, the fact that some controllers very rarely actuate cannot be used to justify inaction for the entire class of intermittent-bleed controllers. In addition to the fact that intermittent-bleed controllers frequently function improperly, as discussed above, some actuate very frequently. Of the 377 controllers studied by Allen *et al.* (2015), 24 were intermittent-bleed controllers that actuated at least 10 times during the sampling period, which was typically 15 minutes. Four actuated over 50 times while sampled. These controllers can emit at high levels – five of the 40 highest emitting controllers studied by Allen *et al.* (2015) are intermittent-bleed controllers that were assessed to be operating properly. Since there are available approaches to avoid these emissions, EPA must issue appropriate standards to address this type of pneumatic controller.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** Darin Schroeder, David McCabe, Lesley Fleishman and Conrad Schneider

**Commenter Affiliation:** Clean Air Task Force et al.

**Document Control Number:** EPA-HQ-OAR-2010-0505-7062

**Comment Excerpt Number:** 75

**Comment:** The proposed emissions standards for the transmission and storage segment extend the very feasible and highly cost-effective approach that EPA and some states have taken to reduce harmful emissions from these devices. However, the proposed standards fall short of BSER for two reasons.

First, the proposed standards for continuous-bleed pneumatic controllers do not reflect BSER, because, for most facilities, they only limit emissions by requiring that newly installed continuous-bleed controllers be “low-bleed,” meaning that they emit, according to a manufacturer’s specification, six standard cubic feet per hour (scfh) or less. While lower emitting than “high-bleed” pneumatic controllers, low-bleed controllers often improperly emit at a higher rate than they are designed to emit, and above the six scfh threshold. EPA’s standards need to reflect that emissions from all types of pneumatic controllers can be essentially eliminated at many types of facilities using two basic approaches:

- Use inherently zero-emitting technologies, such as air-driven pneumatic controllers or electric controllers, instead of natural gas-driven pneumatic controllers.
- Reduce emissions from natural gas driven pneumatic controllers by routing bleed gas to a process, such as a VRU or on-site fuel line, or a control device.

Accordingly, the emissions from low-bleed controllers – due to both their normal operations and improper functioning – can be minimized. Nevertheless, EPA’s proposal only requires zero-

emitting technologies for new continuous-bleed pneumatic controllers at gas processing plants and fails to require them at other facilities, despite the fact that they are feasible at many other sites. And although routing emissions to a process or control device would be feasible at many sites, EPA never requires this approach. Finally, EPA's proposal does not require operators to ensure that pneumatic controllers are performing properly, so emissions from improperly functioning devices will continue indefinitely in many cases.

Second, the proposed standards only apply to continuous-bleed pneumatic controllers and thus do not address harmful emissions from intermittent-bleed pneumatic controllers, which are a very significant source of methane emissions. The two approaches described above – inherent zero-emitting technologies and route to process/control – can also apply to intermittent-bleed controllers, so emissions from these devices can be essentially eliminated at many sites. Additionally, as outlined above for continuous bleed devices requirements should apply to intermittent devices in all sectors of the value chain and operators should be required to ensure the devices are properly functioning as part of compliance demonstrations.

In sum, EPA must strengthen the proposed standards, as discussed in detail below, by requiring operators to use zero-emitting technologies, such as air-driven or electric controllers, at oil and gas facilities where electric power is available. At facilities where zero-emitting technologies are not feasible, operators should be required to capture emissions from all gas-drive pneumatic controllers and route them to a VRU or use them for fuel gas, if appropriate equipment is available on site. If this equipment is not available but a control device exists on site, emissions from all pneumatic controllers should be routed to that device. Finally, for those sites where none of these approaches are feasible, EPA should require that any pneumatic controllers (both continuous-bleed and intermittent-bleed) be low-emitting, and require that operators regularly inspect and measure emissions from controllers to ensure that they are performing as such.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** Darin Schroeder, David McCabe, Lesley Fleishman and Conrad Schneider

**Commenter Affiliation:** Clean Air Task Force et al.

**Document Control Number:** EPA-HQ-OAR-2010-0505-7062

**Comment Excerpt Number:** 83

**Comment:** Beyond the standards reflected in EPA's proposal, it is also feasible to use zero-bleed devices at facilities with access to grid or renewable energy. Indeed, Colorado requires the use of zero-bleed devices at all new facilities where "on-site electrical grid power is being used" and where such use and "is technically and economically feasible." While Colorado's requirement is limited to sites where grid power is in use, as discussed above, operators also can utilize solar or other non-grid sources of electricity to power pneumatic controllers. Similarly, the Ohio EPA recently released a draft general permit that requires all pneumatic controllers located between the wellhead and the point of custody transfer to an oil pipeline or a natural gas transmission line or storage facility to be no-bleed or non-gas driven.

Furthermore, EPA has not considered the availability of reducing emissions from pneumatic controllers by routing gas that would otherwise be vented from them to a process or a control device. Wyoming requires operators of new and existing pneumatic controllers to either route emissions to a closed loop system or limit emissions to low-bleed levels.

EPA has also failed to address emissions from intermittent-bleed pneumatic controllers in any way. Lastly, EPA has not required operators to ensure that controllers are performing properly, and not excessively emitting.

Because the agency has omitted important sources of emissions for which controls exist, and more effective options for controlling emissions exist for many – if not most – pneumatic controllers, EPA must strengthen the proposed standards. Doing so will address emissions from intermittent-bleed pneumatic controllers and more effectively control emissions from continuous bleed controllers than under EPA's current proposal.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** John Quigley

**Commenter Affiliation:** Pennsylvania Department of Environmental Protection (DEP)

**Document Control Number:** EPA-HQ-OAR-2010-0505-6800

**Comment Excerpt Number:** 25

**Comment: Continuous Bleed Natural Gas-Driven Pneumatic Controllers Located from the Wellhead to the Natural Gas Processing Plant or Point of Custody Transfer to an Oil Pipeline**

The EPA is proposing that each single continuous bleed natural gas-driven pneumatic controller located from the wellhead to the natural gas processing plant or point of custody transfer to an oil pipeline must have a natural gas bleed rate less than or equal to 6 scfh (unless there are functional needs, including but not limited to response time, safety, and positive actuation, requiring a bleed rate greater than 6 scfh).

The DEP recommends that, wherever electricity is available, the owner or operator of the facility should be required to install and operate electrical pneumatic controllers.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** Darin Schroeder, David McCabe, Lesley Fleishman and Conrad Schneider

**Commenter Affiliation:** Clean Air Task Force et al.

**Document Control Number:** EPA-HQ-OAR-2010-0505-7062

**Comment Excerpt Number:** 5

**Comment:** We likewise encourage EPA to build from the standards the agency has proposed by strengthening the scope, control measures, and monitoring requirements applicable to pneumatic controllers. In particular, we recommend EPA

- Apply the pneumatic controller standards to intermittent-bleed as well as continuous-bleed natural gas-driven pneumatic controllers.
- Require operators to use inherently zero-emitting technologies, such as air driven pneumatic controllers or electric controllers, instead of natural gas-driven pneumatic controllers, at oil and gas facilities where electric power is available.
- Require operators to reduce emissions from natural gas driven pneumatic controllers by routing bleed gas to a process, such as a VRU or on-site fuel line, or a control device.
- Require rigorous monitoring of emissions from pneumatic controllers to ensure these devices are operating properly, given substantial recent evidence documenting their propensity for malfunction.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** Theresa Pugh

**Commenter Affiliation:** Interstate Natural Gas Association of America (INGAA)

**Document Control Number:** EPA-HQ-OAR-2010-0505-6872

**Comment Excerpt Number:** 30

**Comment:** GHGRP Data Indicates T&S Emissions from Continuous Bleed Pneumatic Controllers Are Relatively Low. Thus, Pneumatic Controllers in T&S Should Not Be an Affected Source.

The GHGRP requires reporting of T&S emissions from pneumatic controllers based on an inventory of devices (by type) and associated emission factors. Review of GHGRP reported data and comparison to estimates (e.g., per facility) from EPA's annual inventory indicate that GHGRP pneumatic device emission estimates are several times lower than EPA's national inventory estimate for the T&S sector.

EPA should more closely review and consider the more current information from the GHGRP. GHGRP reporting indicates that pneumatic controller emissions are far lower than EPA's historical estimate. Thus, these emissions comprise a small percentage of total methane emissions from T&S sources. EPA should consider excluding pneumatic device regulations from the regulation for T&S compressor stations.

**Response:** Contrary to the commenter's assertions, the EPA did consider the GHGRP data in developing emission estimates for the transmission and storage segment. The emission factors used in the BSER analysis for low- and high-bleed pneumatic controllers were those required

under the GHGRP, 40 CFR part 98, subpart W, table W-3 (see the TSD for the proposed rule). The resulting BSER analysis found control of emissions from controllers in the transmission and storage segment to be cost effective.

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**Commenter Name:** C. Wyman

**Commenter Affiliation:** American Gas Association

**Document Control Number:** EPA-HQ-OAR-2010-0505-6874

**Comment Excerpt Number:** 15

**Comment:** EPA Should Consider Emissions Information Reported Under Subpart W Of The GHGRP In Its Analysis And When Considering Whether Regulation Is Warranted.

As EPA recognizes, the Agency is collecting data from T&S compressor stations under Subpart W of the GHGRP, which requires annual leak surveys and compressor vent measurements for T&S compressor stations. Since 2011, thousands of measurements have been completed and reported to EPA. Because an objective of the GHGRP is to inform policy decisions, EPA should closely review Subpart W reported data to understand implications for this initial regulation of methane emissions from natural gas operations. Although Subpart W only captures a subset of compressor station facilities, emissions can still be compared to EPA historical estimates by comparing on a common "activity data" basis. In other words, because EPA estimates for T&S in the annual national GHG inventory are often based on facility counts or compressor counts, comparisons of historical estimates could be made against emissions per facility or emissions per compressor values. A cursory review of the data indicates as follows:

- Focusing on "gross emitters" is warranted because a small number of measured leaks are responsible for the majority of compressor station leak emissions.
- Emissions from centrifugal turbines with wet seal degassing vents are significantly less than EPA's national inventory estimate.
- Pneumatic controller emissions for T&S are lower than EPA's national inventory estimate.

The first item supports focusing on gross emitters and considering alternatives such as DI&M, as AGA proposes above. The emission estimates for two affected sources – centrifugal compressors with wet seals and pneumatic devices – raise questions about the potential environmental benefit and the need for the proposed regulation. AGA recommends that EPA closely review emissions data from Subpart W and revisit its cost-benefit analysis in the Technical Support Document (TSD) based on more current emission estimates.

**Response:** See responses to DCN EPA-HQ-OAR-2010-0505-6872, Excerpt 30 and DCN EPA-HQ-OAR-2010-0505-6872, Excerpt 34 (located in Chapter 4 of this document).

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**Commenter Name:** Darin Schroeder, David McCabe, Lesley Fleishman and Conrad Schneider  
**Commenter Affiliation:** Clean Air Task Force et al.  
**Document Control Number:** EPA-HQ-OAR-2010-0505-7062  
**Comment Excerpt Number:** 80

**Comment:** Several recent studies report that pneumatic controllers often emit more than they are designed to emit.

- Allen *et al.* (2015). As part of this study, an expert group reviewed the behavior of the 40 highest emitting controllers in the study, which were responsible for 81 percent of the emissions from all controllers in the study (377 controllers). The expert group concluded that “many of the devices in the high emitting group were behaving in a manner inconsistent with the manufacturer’s design.” Of the forty high-emitting controllers, 28 were judged to be operating incorrectly due to equipment issues. The study reported that many devices observed to actuate, i.e. intermittent-bleed controllers, also had continuous emissions.
- Allen *et al.* (2013). As noted above, this study reported that emissions from low-bleed pneumatic controllers were 270% higher than EPA’s emissions factor for these devices – 5.1 scfh. Many low-bleed controllers are specified to emit far less than this: EPA’s Gas Star program has documented many low-bleed controller models with bleed rates of less than 3 scfh, and of course the emissions factor used by EPA for low-bleeds (1.39 scfh) implies that many low-bleeds are expected to emit at a very low level. Assuming that some low-bleed controllers are performing as specified, the high emission rate observed by Allen *et al.* (2013) implies that many “low-bleed pneumatic controllers” are in fact emitting more than the design threshold of 6 scfh for low-bleeds – or much more than 6 scfh – simply to raise the average emission rate to 5.1 scfh.
- City of Fort Worth Study. The Fort Worth Study examined emissions from 489 intermittent pneumatic controllers using infrared cameras, Method 21, and a HiFlow sampler for quantification, and found that many of these controllers were emitting constantly and at very high rates, even though these devices were used to operate separator dump valves and were not designed to emit in between actuations. Average emission rates for the controllers in the Fort Worth Study approached the average rate of a high-bleed pneumatic controller. According to the study authors, these emissions were frequently due to improperly functioning or failed controllers.
- British Columbia Study. The Prasino study of pneumatic controller emissions in British Columbia also noted the potential for maintenance issues to lead to abnormally high bleed rates. Although the researchers did not identify a cause for these unexpectedly high emission rates, the results are consistent with the observation that maintenance and operational issues can lead to high emissions.
- The Carbon Limits Study. The Carbon Limits Report confirms these findings and also concludes that LDAR programs may help to identify other improperly functioning devices like pneumatic controllers.

EPA reports indicate that emissions from natural gas-driven pneumatic controllers are very large, probably over one million metric tons of methane per year, and recent independent research shows that these figures are likely an underestimate of current pollution from these

devices. Intermittent-bleed pneumatic controllers contribute a large portion of these emissions. Furthermore, research indicates that pneumatic controllers often function improperly and, as a result, emit significantly more than they are designed to emit.

**Response:** See section VIII.D.1 of the preamble to the final rule and response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** Theresa Pugh

**Commenter Affiliation:** Interstate Natural Gas Association of America (INGAA)

**Document Control Number:** EPA-HQ-OAR-2010-0505-6872

**Comment Excerpt Number:** 31

**Comment:** EPA Should Clarify that for T&S, Pneumatic Controllers Are Only an Affected Source at Compressor Stations.

As stated above, INGAA does not believe pneumatic controllers should be covered in the final rule. However, if EPA decides to include T&S pneumatic controllers as an affected source, the final rule should more clearly indicate that Subpart OOOOa only applies to devices located at compressor stations and not at locations along the pipeline (e.g., metering stations).

From preamble discussion and support documents, it appears that EPA only intends to regulate pneumatic devices at compressor stations. However, the Proposed Rule does not clearly state this, and clarification is warranted. The Proposed Rule applicability section and definition could lead to the conclusion that pneumatic controller affected sources in T&S are not limited to pneumatics located at compressor stations.

In § 60.5365a(d)(1), the affected source is listed for pneumatics not located at gas processing plants, which includes T&S operations:

(d)(1) Each pneumatic controller affected facility not located at a natural gas processing plant, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh.

And, “pneumatic controller” is defined in § 60.5430a:

Pneumatic controller means an automated instrument used for maintaining a process condition such as liquid level, pressure, delta-pressure and temperature.

Neither of these citations limits applicability to the compressor station for T&S operations. Either or both of these subsections should be revised to indicate that for T&S, pneumatic controllers are only subject if located at a compressor station. If EPA intends broader applicability, then its support analysis is lacking, and additional analysis is required to accurately assess the costs and benefits from regulating pneumatics at other locations along a pipeline (e.g., at metering stations).

**Response:** The EPA did not intend to regulate only those pneumatic controllers located at compressor stations in the transmission and storage segment, and not controllers at locations along the pipeline such as metering stations. In the proposed rule, the EPA defined pneumatic controller affected facility as "Each pneumatic controller affected facility not located at a natural gas processing plant, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh." (60.5365a(d)(1)) Further, in the preamble to the proposed rule, the EPA stated, "In this action, we are proposing VOC standards for the remaining pneumatic controllers in the source category. We are also proposing methane standards for all pneumatic controllers in the oil and natural gas source category." Neither statement gives any indication that EPA intended to exempt controllers along natural gas pipelines (e.g., metering stations). In the final rule, the EPA is finalizing requirements that pneumatic controller affected facilities must use low-bleed controllers in place of high-bleed controllers (i.e., natural gas bleed rate not to exceed 6 scfh) at all locations within the source category except for natural gas processing plants.

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**Commenter Name:** Kelly Guertin, Senior Environmental Engineer, Environmental Management and Resources

**Commenter Affiliation:** DTE Energy (DTE Gas Company)

**Document Control Number:** EPA-HQ-OAR-2010-0505-7052

**Comment Excerpt Number:** 18

**Comment:** DTE Energy agrees with AGA's and INGAA request that EPA clarify the scope of the regulations, including EPA's intention to only regulate compressor stations associated with underground storage and compressors and pneumatic devices located at compressor stations.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-6872, Excerpt 31.

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**Commenter Name:** C. Wyman

**Commenter Affiliation:** American Gas Association

**Document Control Number:** EPA-HQ-OAR-2010-0505-6874

**Comment Excerpt Number:** 23

**Comment:** EPA Should Clarify Its Intention To Only Regulate Centrifugal Compressors, Reciprocating Compressors, And Pneumatic Devices At Compressor Stations.

Based on EPA's summary of the proposed rule in the preamble and support documents, AGA believes that EPA only intends to regulate centrifugal compressors, reciprocating compressors, and pneumatic devices at compressor stations. Thus, this equipment located outside of the compressor station fence line, for example at metering stations, would not be affected. However, the applicability sections and definitions in the proposed rule could lead to the conclusion that these equipment types are affected sources in T&S regardless of their location—i.e., not limited to equipment at compressor stations.

AGA encourages EPA revise section 60.5365a as follows so that it is clear that the "affected facility" for this equipment is limited to equipment at compressor stations.

(b) Each centrifugal compressor affected facility, which is a single centrifugal compressor using wet seals, **located at a compressor station site as defined in § 60.5430a**. A centrifugal compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

(c) Each reciprocating compressor affected facility, which is a single reciprocating compressor, **located at a compressor station site as defined in § 60.5430a**. A reciprocating compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

(d)(1) Each pneumatic controller affected facility not located at a natural gas processing plant, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh, **located at a compressor station as defined in § 60.5430a**.

If EPA intends for its proposed rule to have broader applicability by including this equipment not located at compressor stations, such as devices at small metering stations, then EPA's supporting analysis justifying its proposed rule is lacking. Additional analysis would be needed to accurately assess the costs and benefits associated with regulating this equipment outside of the compressor station fence line.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-6872, Excerpt 31.

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#### 6.4. Other Comments on Pneumatic Controllers

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**Commenter Name:** Don Anderson, Director of Environmental

**Commenter Affiliation:** MarkWest Energy Partners, L.P.

**Document Control Number:** EPA-HQ-OAR-2010-0505-6957

**Comment Excerpt Number:** 34

**Comment:** The effective date for installing pneumatic controllers at a location other than at a natural gas processing plant listed in proposed 40 C.F.R. § 60.5390a(c)(2) refers to a previous version of Subpart OOOO:

Each pneumatic controller affected facility constructed, modified or reconstructed on or after October 15, 2013, at a location other than at a natural gas processing plant must be tagged with the month and year of installation, reconstruction or modification, and identification information that allows traceability to the records for that controller as required in § 60.5420a(c)(4)(iii).

Since this is a new requirement, this date should be corrected to reflect the applicability date of Subpart OOOOa, namely September 18, 2015.

**Response:** The EPA agrees with the commenter that the October 15, 2013 date referred to a previous version of Subpart OOOO. We have updated § 60.5390a(c)(2) in the final rule, and removed the reference to the Subpart OOOO date.

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**Commenter Name:** Kathleen M. Sgamma, Vice President, Government and Public Affairs

**Commenter Affiliation:** Western Energy Alliance

**Document Control Number:** EPA-HQ-OAR-2010-0505-6930

**Comment Excerpt Number:** 43

**Comment:** The effective date for installing pneumatic controllers at a location other than at a natural gas processing plant listed in proposed 40 C.F.R. § 60.5390a(c)(2) refers to a previous version of NSPS OOOO:

Each pneumatic controller affected facility constructed, modified or reconstructed **on or after October 15, 2013**, at a location other than at a natural gas processing plant must be tagged with the month and year of installation, reconstruction or modification, and identification information that allows traceability to the records for that controller as required in § 60.5420a(c)(4)(iii).

Since this is a new requirement, this date should be corrected to reflect the applicability date of OOOOa, namely September 18, 2015.

**Response:** See the response to DCN EPA-HQ-OAR-2010-0505-6957, Excerpt 34.

**Commenter Name:** Kathleen M. Sgamma, Vice President, Government and Public Affairs  
**Commenter Affiliation:** Western Energy Alliance  
**Document Control Number:** EPA-HQ-OAR-2010-0505-6930  
**Comment Excerpt Number:** 45

**Comment:** *Operators should not be required to individually tag “affected facilities.”*

For affected pneumatic controllers only—or, continuous high-bleed devices, as discussed above—operators should only be required to maintain a list of make, model, and serial number, rather than individual tags. A list of make, model, and serial number will achieve the same results desired by EPA, without presenting the unnecessary operational hurdles associated with individual tagging and recordkeeping. For example, tags can be damaged by weather and are unnecessarily difficult to maintain. Moreover, OOOOa appears to require operators to tag both facilities that constitute “affected facilities,” and those that do not; which is unnecessary, confusing, and likely illegal. The proposal effectively requires tagging for components that fall under NSPS OOOO and for components that do not, which essentially requires operators to prove the negative. By tagging devices to prove they do not fall under the rule, EPA is imposing the same recordkeeping requirements on these devices even though they have been deemed to have low enough emissions to not be a cost-effective target for reductions. We believe such requirement exceeds EPA’s legal authority and ignores the requirement to only promulgate rules which are determined to be cost-effective.

**Response:** The EPA disagrees with the commenter that the final rule should not require the tagging of pneumatic controller affected facilities. We believe that this requirement will facilitate compliance inspections. We note that only those pneumatic controllers that are defined as affected facilities under § 60.5365a(d) are required to meet the tagging and associated recordkeeping requirements under § 60.5390a(a). We have structured the final rule so that only pneumatic controllers with bleed rates higher than the applicable standard, *i.e.*, those for which the owner/operator has determined that a bleed rate greater than the applicable standard is required based on functional needs, are classified as affected facilities. Only such affected facilities are subject to tagging and the associated recordkeeping requirements.

The EPA believes that it is important to tag such pneumatic controllers to allow for ready identification by an inspector. The owner/operator is required to document the need for this exemption from the otherwise applicable standards, and easy identification of such controllers is necessary so that an inspector can verify the specifics of the documentation. We understand that durable tags are available that will withstand exposure to the weather.

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**Commenter Name:** Don Anderson, Director of Environmental  
**Commenter Affiliation:** MarkWest Energy Partners, L.P.  
**Document Control Number:** EPA-HQ-OAR-2010-0505-6957  
**Comment Excerpt Number:** 36

**Comment:** Operators should not be required to individually tag "affected facilities"

For affected pneumatic controllers only-or, continuous high-bleed devices, as discussed above-operators should only be required to maintain a list of make, model, and serial number, rather than individual tags. A list of make, model, and serial number will achieve the same results desired by EPA, without presenting the unnecessary operational hurdles associated with individual tagging and recordkeeping. For example, tags can be damaged by weather and are unnecessarily difficult to maintain. Moreover, NSPS OOOOa appears to require operators to tag both facilities that constitute "affected facilities," and those that do not; which is unnecessary, confusing, and likely illegal. The proposal effectively requires tagging for components that fall under the NSPS and for components that do not, which essentially requires operators to prove the negative. By tagging devices to prove they do not fall under the rule, EPA is imposing the same recordkeeping requirements on these devices even though they've been deemed to have low enough emissions to not be a cost-effective target for reductions. We believe such requirement exceeds EPA's legal authority and ignores the requirement to only promulgate rules which are determined to be cost-effective.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-6930, Excerpt 45.

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**Commenter Name:** Pamela F. Faggert, Chief Environmental Officer and Vice President-Corporate Compliance

**Commenter Affiliation:** Dominion Resources Services, Inc.

**Document Control Number:** EPA-HQ-OAR-2010-0505-6946

**Comment Excerpt Number:** 15

**Comment:** In 60.5365a(d)(1), pneumatic controller affected facilities not located at a natural gas processing plant is defined as those single continuous bleed natural gas driven pneumatic controllers with a bleed rate greater than 6 standard cubic feet per hour (scf/hr). Based on this definition, it is understood that pneumatic controllers greater than 6 scf/hr would not be subject to this regulation. However, the proposed rule subsequently indicates that controllers that have a bleed rate greater than 6 scf/hr (60.5390a(c)(1)) have additional requirements for tagging and identification in the proposed 60.5390a(c)(2). We request that if the pneumatic controllers are exempt from the regulation (i.e., with a bleed rate of less than or equal to 6 scf/hr), no additional requirements should be applicable.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-6930, Excerpt 45.

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**Commenter Name:** Pamela F. Faggert, Chief Environmental Officer and Vice President-Corporate Compliance

**Commenter Affiliation:** Dominion Resources Services, Inc.

**Document Control Number:** EPA-HQ-OAR-2010-0505-6946

**Comment Excerpt Number:** 5

**Comment:** Dominion has implemented a number of voluntary measures and specifications for new and existing units and for new and existing stations which have and will result in lower methane emissions. For example, high-bleed pneumatic devices and wet seal centrifugal compressors are no longer installed at new Dominion facilities. DTI has also implemented efforts to replace high-bleed pneumatic devices and to replace wet seal compressor with dry seals at existing facilities. Data from a recent study conducted by Colorado State University and the Environmental Defense Fund on emissions from the transmission and storage segment, in which Dominion was a participant, show that Dominion is not alone in its selection of equipment installations, i.e. the population counts of high bleed pneumatic devices and wet seal centrifugal compressors are much lower than previous studies in the 1990s indicated.

**Response:** As discussed in the TSD for the proposed rule, our estimate of the typical number of pneumatic controllers of all types installed annually in the transmission and storage segment was based on annual population data from the *Inventory of U.S. GHG Emissions and Sinks: 1990-2012* (GHG Inventory). We then approximated the fraction of the newly installed pneumatic controllers that would be continuous bleed controllers, rather than intermittent controllers, based on raw data from the 1996 GRI study, where 32 percent of the pneumatic controllers are continuous bleed devices in the transmission and storage segment. Our resulting estimate is that a total of approximately 262 continuous bleed pneumatic controllers are installed in the segment each year. For the final rule, we revised our estimate based on the most recent GHG Inventory data. For the final rule, we estimate a total of 120 continuous bleed pneumatic controllers are installed in the segment each year. We believe that these projections are reasonable and supported by the record.

In estimating baseline nationwide annual emissions from new pneumatic controllers in the transmission and storage segment, we assumed that all bleed-devices have the high-bleed emission rates estimated in Table W-3 to subpart W of the GHG Reporting Rule (40 CFR part 98, subpart W) since it cannot be predicted which sources would install a low-bleed versus a high-bleed controller. In the absence of a regulatory framework requiring installation of low-bleed pneumatic controllers, any and all controllers installed in the future could be high-bleed controllers.

We acknowledge that voluntary efforts to reduce methane emissions from continuous bleed pneumatic controllers are being implemented by some companies. We note that the lower emissions devices the commenter mentioned (e.g., dry seals, and low-bleed pneumatics) are not regulated under this rule.

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**Commenter Name:** Will Whisenant, Safety and Security Operations Coordinator

**Commenter Affiliation:** Virginia Oil and Gas Association (VOGA)

**Document Control Number:** EPA-HQ-OAR-2010-0505-7047

**Comment Excerpt Number:** 2

**Comment:** The section regarding Pneumatic Controllers and pumps should have a focus on high bleed devices and relaxed testing, recordkeeping, and reporting requirements for operators that have switched to low-bleed or air-controlled devices.

**Response:** The EPA agrees with the commenter that the rule should focus on pneumatic controllers with higher emission rates. We note that low-bleed or air-controlled devices are not subject to this NSPS, and therefore have no requirements under this rule. For a more comprehensive discussion of this issue, please see our response to DCN EPA-HQ-OAR-2010-0505-6930, Excerpt 45.

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## 6.5 Regulation of Intermittent and Snap Acting Controllers

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**Commenter Name:** Darin Schroeder, David McCabe, Lesley Fleishman and Conrad Schneider

**Commenter Affiliation:** Clean Air Task Force et al.

**Document Control Number:** EPA-HQ-OAR-2010-0505-7062

**Comment Excerpt Number:** 86

**Comment:** EPA Should Strengthen Standards to Address Intermittent-Bleed Controllers.

EPA has declined in the proposed rule to adopt standards for intermittent-bleed controllers, stating that “[i]ntermittent controllers are inherently low emitting sources because they vent only when actuating and the total emissions are dependent on the applications in which they are used.” This argument is problematic in several ways. First, EPA’s own emission factor (from the Reporting Program) for intermittent-bleed pneumatic controllers, 13.5 scfh per controller, would result in about 1.9 metric tons of methane per year, per device, while also emitting other pollutants. As described above, Allen *et al.* (2013) report that emissions from intermittent-bleed pneumatic controllers are still higher, by 29 percent. Based solely on these emissions factors, EPA’s statement that intermittent-bleed controllers are “low emitting” is not supported by the scientific evidence.

Moreover, as discussed above in Section XX, intermittent-bleed controllers often improperly function and emit continuously, contradicting EPA’s statement that these devices only vent when actuating. For example, Allen *et al.* (2015) provide time traces of the emissions from the 40 highest-emitting pneumatic controllers that they measured. These 40 controllers represented only 11 percent of the controllers measured in the study but accounted for 81 percent of the emissions. At least 11 of these 40 controllers were intermittent-bleed devices that were improperly functioning. For example, one controller (i.d. number CZ10-PC01) only actuated twice during a 30-minute measurement period, but emitted (over the entire period) at an average rate of 43.2 scfh of whole gas. Given the fact that emissions from individual, supposedly intermittent controllers are significant, as well as the very large number of such controllers in use, their emissions are of great concern. As shown above in Table 11, according to the Reporting Program, 85 percent of reported methane emissions from production pneumatic controllers – amounting to 849,096 tons of methane per year – originates from intermittent-bleed controllers.

EPA must address these emissions. The approaches described above – use of zero-emitting technologies and route to process or control – are just as feasible as a means of capturing emissions from intermittent-bleed controllers as they are from continuous-bleed controllers.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** Camilla Feibelman  
**Commenter Affiliation:** Rio Grande Chapter of the Sierra Club  
**Document Control Number:** EPA-HQ-OAR-2010-0505-6895  
**Comment Excerpt Number:** 14

**Comment:** We further urge EPA to cover intermittent or snap-acting pneumatic controllers—which are significant sources of emissions--as well as liquids unloading operations. Control techniques for these sources are discussed in detail in the Waste Not report.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** T. Bacci  
**Commenter Affiliation:** Citizen  
**Document Control Number:** EPA-HQ-OAR-2010-0505-6471  
**Comment Excerpt Number:** 11

**Comment:** We urge the -- you to improve the proposed rules to include:

- Several key pieces of equipment that were omitted from the proposal that emit methane and harmful VOCs:
  - Pneumatic controllers that operate on an intermittent or snap-acting basis

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** S. Hathaway  
**Commenter Affiliation:** Citizen  
**Document Control Number:** EPA-HQ-OAR-2010-0505-6473  
**Comment Excerpt Number:** 12

**Comment:** We urge you, even knowing that it's futile, to improve the proposed weak rules to include:

- Several key pieces of equipment that were omitted from the proposal that emit methane and harmful VOCs:
  - Pneumatic controllers that operate on an intermittent or snap-acting basis;

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** Jonas Kron

**Commenter Affiliation:** Trillium Asset Management, LLC

**Document Control Number:** EPA-HQ-OAR-2010-0505-6794

**Comment Excerpt Number:** 8

**Comment:** In particular, we urge the EPA to strengthen the proposal by covering the following equipment and practices: Pneumatic controllers that operate on an intermittent or snap-acting basis.

Based on our research, we believe that these four areas are linked to meaningful amounts of methane emissions. Furthermore, studies strongly suggest that there are low cost controls that exist for all areas.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** Seth B. C. Shonkoff, Executive Director, Jake Hays, Director, Environmental Health Program and Renee L. Santoro Director, Energy Environment Program,

**Commenter Affiliation:** PSE Healthy Energy

**Document Control Number:** EPA-HQ-OAR-2010-0505-6951

**Comment Excerpt Number:** 10

**Comment:** Pneumatic controllers operate on an intermittent or snap-acting basis and are a source of methane emissions that the EPA is currently assessing. The literature indicates that Pneumatic controllers are a source of methane and VOC emission and as such should fall under this rule.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** William C. Allison

**Commenter Affiliation:** Colorado Department of Public Health and Environment

**Document Control Number:** EPA-HQ-OAR-2010-0505-6876

**Comment Excerpt Number:** 15

**Comment:** The Division questions EPA's determination that emissions from intermittent pneumatic controllers do not need to be addressed. EPA stated that EPA considers the intermittent pneumatic controllers to be inherently low emitting sources because the controllers vent only when actuating and the total emissions are dependent on the applications in which they are used. However, EPA discussed several studies in EPA's Pneumatic Controllers white paper that noted the higher percentage of intermittent pneumatic controllers, as compared to continuous bleed pneumatic controllers, and the potentially high emissions from intermittent pneumatic controllers. Therefore, the Division believes that EPA should further consider opportunities to reduce emissions from intermittent pneumatic controllers.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** C. William Giraud

**Commenter Affiliation:** Concho Resources Inc.

**Document Control Number:** EPA-HQ-OAR-2010-0505-6847

**Comment Excerpt Number:** 4

**Comment:** If EPA, however, proceeds with the adoption of these regulations Concho requests the following revisions be included.

**If proposed controls for pneumatic devices are required, those controls should be limited**

While Concho believes that the Proposed Methane Standards are not warranted at this time, if EPA proceeds with adoption of such standards, it should clearly identify which pneumatic devices are affected. The cited controls are appropriate only for high-bleed pneumatic devices with an emission rate greater than six standard cubic feet per hour (6 scfh). The EPA should expressly state in any rule adopted that intermittent-bleed and low-bleed devices are not "affected facilities" and will not be subject to high-bleed device requirements. This will provide both operators and regulators with certainty, resulting in better compliance.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** Gary Buchler

**Commenter Affiliation:** Kinder Morgan, Inc.

**Document Control Number:** EPA-HQ-OAR-2010-0505-6857

**Comment Excerpt Number:** 27

**Comment:** EPA specifically excluded intermittent pneumatic controllers from the Proposed NSPS OOOOa Rule, because "intermittent controllers are inherently low emitting sources because they vent only when actuating, and the total emissions are dependent on the applications in which they are used." Kinder Morgan supports EPA's exclusion of intermittent pneumatic controllers from the Proposed NSPS OOOOa Rule for the reasons described by EPA and only asks that EPA specifically confirm this exemption in its preamble to any final NSPS OOOOa rule.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** Kathleen M. Sgamma, Vice President, Government and Public Affairs  
**Commenter Affiliation:** Western Energy Alliance  
**Document Control Number:** EPA-HQ-OAR-2010-0505-6930  
**Comment Excerpt Number:** 44

**Comment:** It is our understanding that the definition of “affected facilities” only applies to high-bleed continuous pneumatic controllers. Per NSPS OOOO:

Each pneumatic controller affected facility constructed, modified or reconstructed on or after October 15, 2013, at a location between the wellhead and a natural gas processing plant or the point of custody transfer to an oil pipeline must have a bleed rate less than or equal to 6 standard cubic feet per hour.

*See* 40 C.F.R. § 60.5390(c)(1). We request that EPA clarify in its final rule that intermittent bleed and low-bleed devices are not “affected facilities” and will not be subject to these requirements for high-bleed devices.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** Don Anderson, Director of Environmental  
**Commenter Affiliation:** MarkWest Energy Partners, L.P.  
**Document Control Number:** EPA-HQ-OAR-2010-0505-6957  
**Comment Excerpt Number:** 35

**Comment:** The proposed controls for pneumatic controllers should apply only to high-bleed devices with an emission rate greater than six standard cubic feet per hour ("scfh")

It is our understanding that the definition of "affected facilities" only applies to high-bleed, continuous pneumatic controllers. Per the original NSPS OOOO:

Each pneumatic controller affected facility constructed, modified or reconstructed on or after October 15, 2013, at a location between the wellhead and a natural gas processing plant or the point of custody transfer to an oil pipeline must have a bleed rate less than or equal to 6 standard cubic feet per hour.

*See* § 60.5390 (c)(1). We request that EPA clarify in its final rule that intermittent-bleed and low-bleed devices are not "affected facilities" and will not be subject to these requirements for high-bleed devices.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** Darin Schroeder, David McCabe, Lesley Fleishman and Conrad Schneider  
**Commenter Affiliation:** Clean Air Task Force et al.  
**Document Control Number:** EPA-HQ-OAR-2010-0505-7062  
**Comment Excerpt Number:** 79

**Comment:** Data for emissions from specific types of pneumatic controllers

Data from the Reporting Program provides information on the distribution of emissions by type of pneumatic controller. As shown in Table 11, the great majority of reported emissions from oil and natural gas production pneumatic controllers originates from intermittent-bleed controllers. Pneumatic controller emissions reported to the Reporting Program from natural gas transmission and storage facilities are very low, most likely because so many of those facilities fall below the reporting threshold for that program (25,000 metric tons CO<sub>2</sub>e per year). Nevertheless, emissions from intermittent-bleed devices represent 40% of reported natural gas transmission and storage pneumatic controller emissions. [Table 11: Emissions by Type of Pneumatic Controller]

As mentioned above, Allen *et al.* (2013) reported that emissions from low-bleed controllers and intermittent-bleed controllers in natural gas production emitted on average 270% and 29%, respectively, more methane per controller than the emissions factor used by EPA to calculate emissions for the Reporting Program. This suggests that nationwide emissions for these types of controllers in the production segment are higher, by similar percentages, than reported by the Reporting Program. This would make the strikingly high portion of emissions from intermittent-bleed controllers even higher.

Allen *et al.* (2015) reports very low emissions per “intermittent vent” pneumatic controller – 2.2 scfh. While this figure is lower than the emissions factor for intermittent-bleed controllers used in the GHGI and Reporting Program, these numbers are not susceptible to an apples-to-apples comparison, primarily because Allen *et al.* (2015) treated many devices that were probably functioning improperly (and therefore high-emitting) intermittent-bleed controllers as continuous-bleed controllers in their analysis.

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.

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**Commenter Name:** Julie Archer, Project Manager; and David McMahon, J.D., Co-Founder  
**Commenter Affiliation:** West Virginia Surface Owners' Rights Organization (WVSORO)  
**Document Control Number:** EPA-HQ-OAR-2010-0505-7066  
**Comment Excerpt Number:** 6

**Comment:** In addition, we urge you to improve the proposed rules to: Include several key pieces of equipment that were omitted from the proposal that emit methane and harmful VOCs: Pneumatic controllers that operate on an intermittent or snap-acting basis;

**Response:** See response to DCN EPA-HQ-OAR-2010-0505-7062, Excerpt 85.